



# Science in Action: EPA Research Supporting States

Region 6 (South Central States)

January 2020





# science in ACTION

## **U.S. EPA Research Supporting States** *Addressing State Research Needs*

The success of environmental protection and public health in the United States begins on the front lines at the state and local levels. U.S. EPA's Office of Research and Development (EPA ORD) is a vital scientific and technical resource to states and their communities, providing the technical support and training, science-based tools, and innovative approaches and methods they need to meet their highest priority environmental and related public health challenges, while also laying the groundwork for long-term health and prosperity.

Collaboration and teamwork with state environmental agencies make that all possible. EPA ORD has developed critical partnerships to ensure our work is relevant to real-world environmental challenges and that scientific findings and tools are delivered to decision makers in ways that make them immediately accessible and useful. EPA ORD has partnered with the Environmental Council of the States (ECOS, the national association of state environmental agency leaders) and its research arm, the Environmental Research Institute of the States (ERIS), to ensure that our research is useful and practical for states to help address on the ground environmental challenges.

Our state partners provide significant insights into the environmental problems they face and how EPA can best translate ORD science into well-informed decision tools for states and communities. Over the past several years, ERIS and EPA ORD have strengthened the alignment of EPA's scientific and technical capabilities with state research priorities and needs through a series of meetings and state surveys. As a result of this effort, EPA ORD better understands the science needs of state environmental agencies, and states better understand EPA ORD's research, tools and role within EPA. As recently as 2018, states identified their needs and grouped them into broad topics, such as water, emerging contaminants/toxics, waste/remediation and air/ozone. EPA ORD values the information the ERIS survey provides, as it will help us to continue to align our research program with state science needs.

This document compiles summaries of how EPA ORD's work during the past several years, in partnership with state agencies, counties, communities and universities, has supported states in their efforts to protect human health and the environment. These stories highlight a wide range of research, development, decision support tools and technical assistance efforts focusing on air and water pollution, chemicals, Superfund and other contaminated site remediation, infrastructure and homeland security – all of which are vitally important to helping states address the highest priority, on the ground environmental challenges.

We look forward to continuing to build our partnership with ECOS/ERIS to develop the science that meets states' immediate and long-term needs.



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## AIR – MODELING AND MONITORING

**Partners:** Participating pilot locations including the cities of Chicago, IL; Durham, NC; Hartford, CT; Houston, TX; Kansas City, KS; Oklahoma City, OK; Philadelphia, PA and Washington, DC

**Challenge:** Air quality monitoring for community awareness (completed)

**Resource:** Village Green Project



*“The Village Green station is a helpful tool in educating the public, and particularly children, about the importance of air quality in our everyday lives. We are thankful to be one of several cities across the country to have such an innovative tool.” – Oklahoma DEQ Executive Director Scott Thompson (referring to the Village Green Project in Oklahoma City)*

The Village Green Project (VGP) is a novel air and weather measurement station originally developed by EPA ORD scientists. The station is a compact, solar-powered system that incorporates air and weather instrumentation into a park bench. The project built upon the need to enhance transparency and

showcases next-generation air measurement technology by providing quality-assured data to the public on a near real-time basis, updating to a public data website every minute.

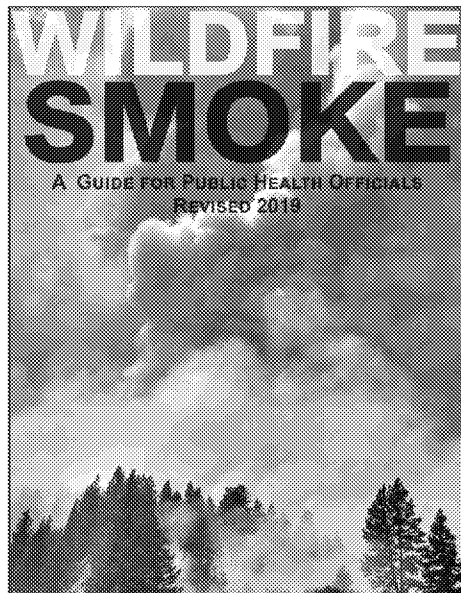
The original prototype was field-tested outside a public library in Durham, NC. Following the successful prototype test, EPA created a pilot VGP expansion and engaged with state, local and tribal agencies in placing new park bench stations in various community environments. There are currently eight Village Green stations in the U.S. located in a variety of environments selected by the grant recipients, such as libraries, a public garden, and high foot-traffic tourist areas. In addition to Oklahoma City, OK, and Durham, NC, participating cities include Hartford, CT; Kansas City, KS; Houston, TX; Washington, DC; Chicago, IL; and most recently Houston, TX. The state and local agencies have used the stations as an opportunity to host public outreach events, including ribbon-cutting ceremonies and informational sessions. All of the benches, with the exception of the Durham bench, have been transitioned to the project partners for further operation.

ORD has developed supplemental resources for communities to construct, operate, and maintain their own Village Green station. For more information, check out the [Village Green Design, Operations, and Maintenance document](#).

**Partner:** Arkansas Department of Environmental Quality (ADEQ) and the Arkansas Forestry Commission

**Challenge:** Ambient air quality and public health considerations from fires (completed)

**Resource:** EPA's Smoke Ready Toolbox for Wildfires



*"Through this forum Arkansas has advanced partnerships for natural resource management to further the protection of human health and the environment. EPA wildfire and air quality research has helped Arkansas spark collaboration and dialogue among those who benefit from, practice, and live on the periphery of prescribed burns." — Arkansas Department of Energy and Environment Secretary Becky Keogh*

Land managers utilize fire in a variety of contexts including forestry, conservation, and agriculture. While Arkansas is attaining and maintaining all national air quality standards, smoke from fires still contains air contaminants that affect air quality. Due largely to the growing urban/rural interface, the interaction between prescribed fire smoke and citizens has increased over time. Facilitating healthy air quality requires ongoing collaboration among land managers and air quality experts.

In March 2018, ADEQ and the Arkansas Forestry Commission jointly hosted a two-day Fire Policy Forum in Little Rock. The Fire Policy Forum was the first of its type in Arkansas and included attendees and speakers from across the country. The forum brought together a diversity of stakeholders, including land owners and managers from federal, state, local, and private sectors, for discussions regarding the intersection of careful and prudent use of "fire as a land management tool," air quality considerations, and solutions to the challenges of balancing these two necessities.

An EPA ORD expert participated in the forum to share EPA wildland fire research on the public health implications of wildfire smoke. The featured presentation informed the Forum's participants of the implications of the growing urban/rural interface and the nearby use of prescribed fire tool. EPA researchers collaborate with communities to facilitate the use of a variety of Agency developed resources to prepare and respond to fires, including the Community Health Vulnerability Index, Smoke Sense app, and *Wildfire Smoke: A Guide for Public Health Officials*. These resources are available on the Smoke Ready Toolbox for Wildfires:

<https://www.epa.gov/smoke-ready-toolbox-wildfires>

The variety of presentations provided an opportunity for forum participants to discuss air quality as a factor to be considered when conducting activities that cause air contaminant emissions and how to incorporate best management practices and plans for use of fire as a management tool. It also fostered a vibrant dialogue surrounding the use of fire as a land management tool and its effect on air quality in the state of Arkansas.

For more information on the forum, please visit: <https://www.adeg.state.ar.us/air/planning/fire-forum.aspx>

**Partner:** Arkansas Department of Environmental Quality (ADEQ), Arkansas Department of Health (ADH)

**Challenge:** Underground fire at abandoned dumping site sparks public health risks (ongoing)

**Resource:** Technical assistance and environmental monitoring



*"The ability to access EPA's Office of Research and Development (ORD) resources and expertise is critical for state response efforts. Arkansas appreciates continuing work with EPA to close the gaps on environmental challenges and to address community concerns."*

– Arkansas Department of Energy and Environment Secretary Becky Keogh

In July 2018, residents of Bella Vista, Arkansas noticed a dull haze and the smell of smoke wafting through their community and seeping into nearby homes and businesses. The source of their concern turned out

to be a smoldering underground fire at a former illegal dumping site. Two former owners of the property had turned it into a kind

of unofficial (and unmonitored) dump, allowing nearby residents to dispose of brush, wood, and other organic material. Unfortunately, according to numerous news reports it is now clear that old car batteries, wiring, and old pool liners were also discarded. Subsequently buried - the whole mess was out of sight, out of mind. That was until smoke started rising from the ground.

Locally known as "the stump dump fire" the conflagration has continued to smolder for more than half a year, sparking health concerns and attracting the attention of ADEQ and ADH, as well as elected officials including the State's Congress Member and both Arkansas Senators. Together, they called on EPA for help.

To date, EPA has provided resources to the state for air monitoring, legal advice, and engineering tactics to assist the state in controlling the fire. Arkansas's congressional delegation along with the local and state officials acknowledge and appreciate this assistance as well as the technical assistance provided by the EPA Region 6 Office in Dallas, Texas," noted Arkansas Congress Member Steve Womack and Arkansas Senators Tom Cotton and John Boozman in a letter to the EPA Administrator asking for additional assistance.

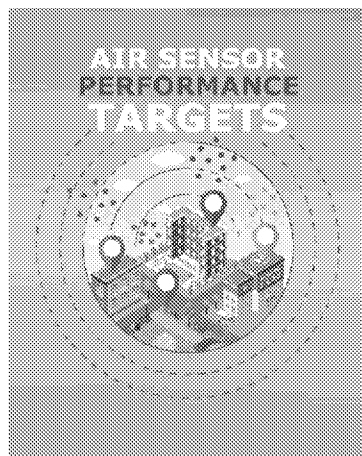
That assistance has included significant technical and scientific support from EPA ORD, part of an ongoing partnership to match ORD expertise and resources with high priority needs in the states. ORD engineers have visited the burning stump dump site to assess conditions and gather information and contributed to an assessment of ongoing management approaches and mitigation options. ORD also provided comments on the ADEQ Draft Response Action Plan and has also been assisting ADEQ with responding to questions the State has received from the plan.

EPA researchers will continue to work closely with the State as officials to continue to monitor air quality and other conditions and provide expert advice as they decide on the best course for minimizing additional risks and move forward with plans to extinguish the fire and revitalize the site.

**Partner:** Environmental Council of the States (ECOS)

**Challenge:** Need for non-regulatory performance targets for sensors that measure fine particulate matter (PM<sub>2.5</sub>) and ozone in the U.S. (ongoing)

**Resource:** “Deliberating Performance Targets for Air Quality Sensors” Workshop and Webinar



*“For this EPA ORD hosted workshop, state attendees were able to contribute the state agency perspective to a broad discussion regarding sensor quality, data quantity, and how smaller, lower-cost air monitoring sensors may be used by state agencies. They were also able to gain a sense of how different parties – national and international, private and public – are handling the addition of smaller, lower-cost sensors to the market.” – ECOS Senior Project Manager Kelly Poole*

Over the past several years, miniaturized, lower-cost air monitoring sensors have entered the market and are now being used by researchers, industrial facilities, state and local government agencies, tribal nations, citizen scientists and the public for a variety of purposes. New applications include a variety of activities, including: real-time high-resolution mapping of air quality at a far greater density than regulatory monitors, real-time public communication of sensor data, fenceline monitoring to detect emissions events, community monitoring to assess hot spots, personal monitoring, and applications to collect data in remote places. Given the rapid adoption and technological advances of new air sensor technologies, there are numerous questions about how well they perform and how lower-cost technologies can be used for certain non-regulatory applications.

EPA, in coordination with ECOS, convened a workshop in June 2018 on “Deliberating Performance Targets for Air Quality Sensors.” The workshop solicited individual stakeholder views related to non-regulatory performance targets for sensors that measure fine particulate matter (PM<sub>2.5</sub>) and ozone in the U.S. Through on-site and webinar discussions, national and international participants addressed a range of technical issues involved in establishing performance targets for air sensor technologies. These issues included for example sensor performance for various measures like limits of detection and calibration, selecting appropriate performance targets, and adopting of one set of performance targets for all non-regulatory purposes, versus a tiered approach for different sensor applications. The workshop included discussion of lessons learned from other countries about choices or trade-offs they have made or debated in establishing performance targets for measurement technologies.

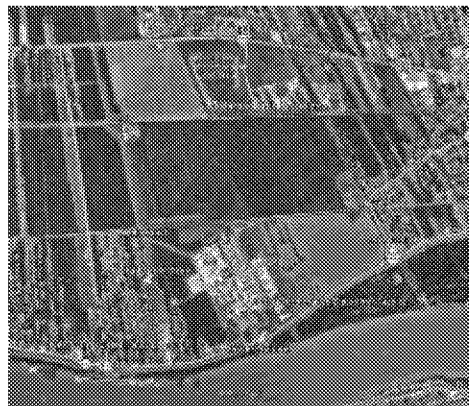
As a follow up, a group of technical experts worked with EPA to document and summarize the individual perspectives communicated at the workshop, within the context of relevant scientific literature. Workshop products, including presentations delivered to the workshop, a report summarizing peer reviewed literature, a brief research highlights article, and a more extensive peer-reviewed journal article discussing the workshop are all publicly available. Links to these resources can be found at the bottom of this webpage: <https://www.epa.gov/air-research/deliberating-performance-targets-air-quality-sensors-workshops>. Two more documents will be released as a result of this workshop in 2020.

## CHEMICALS - ASSESSMENTS

**Partner:** Louisiana Department of Environmental Quality (LDEQ) and LaPlace, LA

**Challenge:** Potential cancer risks from emissions of chloroprene (completed)

**Resource:** IRIS assessment and air quality monitoring



*"I want to thank EPA's Office of Research and Development for their assistance in gathering and interpreting air quality data from around the Denka Performance Elastomer facility in LaPlace, LA. The information ORD provided helped the LDEQ design and implement actions to reduce chloroprene emissions from the plant. The multi-step Denka remedy is in the first stages of its implementation and has already produced significant reductions in chloroprene emissions. When agencies work together, everyone benefits." – LDEQ Secretary Dr. Chuck Carr Brown*

EPA ORD scientists assisted Region 6 (South Central U.S.) and the state of Louisiana with their evaluation of potential cancer risks from emissions of chloroprene from the Denka Performance Elastomer facility in LaPlace. Based on the risk evaluation and an engineering analyses, the company reached an agreement with Louisiana to install control equipment to significantly reduce chloroprene emissions. The facility had been identified in the EPA's National Air Toxics Assessment (December 2015) as the highest cancer risk facility in the U.S., leading to ambient air monitoring in the vicinity of the facility. The air monitoring demonstrated high levels of chloroprene in the ambient air in the surrounding neighborhood and at schools near the facility. ORD scientists and staff from the LDEQ, EPA's Region 6 and Office of Air and Radiation met with the community at a public meeting in LaPlace. EPA researchers characterized the potential health risks associated with chloroprene. EPA directly supported the state of Louisiana in achieving action to reduce public health risks from the chloroprene emissions.



**Partner:** Oklahoma Department of Environmental Quality (DEQ)

**Challenge:** Fish kills and unknown contamination (completed)

**Resource:** Chemical composition analysis



*"The ORD National Exposure Research Laboratory in Las Vegas was a valuable asset during Oklahoma DEQ's investigation into the Red River fish kills. This facility's expertise and analytical technologies assisted with researching potential causative agents related to these fish kills. In addition, I strongly support the mission of ORD to conduct valuable research that leads to improvements in the continued protection of public health and the environment."* — Oklahoma DEQ Executive Director Scott Thompson

Between 2011 and 2013 there were several incidents of concern in the Red River watershed and Red Creek. There were four fish kills with unknown contaminants present in the water, and stray gas bubbling between fish kill events. Oklahoma DEQ requested EPA ORD assistance in identifying the unknown contaminants, and the source of the indeterminate stray gas.

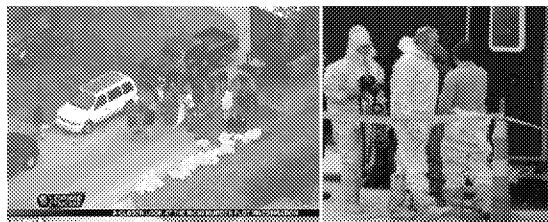
EPA ORD scientists, in collaboration with Region 6 (South Central U.S.) set out to use state-of-the-art analytical tools to identify the contaminants, and to oversee an isotopic analysis of the gases sampled by a private company. Through these techniques, ORD was able to make conditional chemical assignments of the contaminants and help determine that the stray gases were from a biogenic (natural) source. This assistance provided information to Oklahoma DEQ to assist in understanding and managing these incidents.

## HOMELAND SECURITY

**Partner:** Colorado, District of Columbia, Mississippi, Oklahoma, Tennessee, Vermont and Wisconsin state environmental and/or public health agencies

**Challenge:** Enabling state and local communities to rapidly respond to ricin contamination (completed)

**Resource:** Technical assistance to aid field and laboratory approaches for sampling and analysis, operationally applying decontamination methods, and strategically handling wastes



*"Working with the EPA in response to this Ricin incident proved to be invaluable. They provided remediation expertise and testing resources that saved our agency significant staff time. Thanks to their support, the property was appropriately decontaminated, eliminating any potential for future concern. Further, their knowledge and availability helped to ensure that we could quickly respond to the needs of the community." – Boulder County Public Health, Water Quality and Hazardous Waste Coordinator Erin Dodge*

Ricin is a deadly biological toxin that is easily produced from castor beans, making it one of the most worrisome biological threat agents. Multiple ricin incidents occurred following episodes in the popular television show "Breaking Bad" that featured its production. EPA ORD researchers and subject matter experts from the CBRNE Consequence Management Advisory Division in EPA's Office of Land and Emergency Management/Office of Emergency Management were called upon by EPA Regions 1, 3, 4, 5, 6 and 8 to support various state and local communities during independent ricin incidents spanning several years. EPA researchers developed innovative applied solutions to the challenges encountered during the first ricin responses leading to significantly shortened response times and decreased costs and resources required for the subsequent ricin incidents. The developed tools provide the federal government with important new capabilities for helping states and local communities respond to ricin incidents.

As one recent example, EPA ORD researchers rapidly supported EPA Region 8's (Mountains and Plains) response to a ricin incident at a condominium in Boulder, Colorado. The applied solutions directly informed the sampling plan, sample analysis, decontaminant selection, decontamination of responders and their equipment, and handling of the ricin waste. Because the laboratory used ORD's recently developed analysis methods, some post-decontamination samples indicated that ricin was still present in the condominium; these methods removed analytics interferences and, thereby, increased the capability to detect ricin in environmental samples. This information enabled state decision makers to determine that further decontamination of the unit was required to protect public health. Without this research, the condominium could have been declared clean and safe for re-occupancy when in fact ricin would have remained.

During the response to the 2014 Oklahoma City residence ricin contamination incident, EPA ORD scientists supported Region 6 (South Central) by helping with the selection of decontamination agent (bleach) and by providing guidance on the selection of appropriate analytical methods and potential laboratory resources for post-decontamination sample analysis.

These efforts enabled the states and local communities to rapidly respond to ricin contamination incidents and effectively clean up the affected areas. EPA researchers helped close scientific gaps, transition scientific solutions, and enabled the states and local communities to be ready to rapidly respond to the next ricin or other biotoxin incident.

## RISK ASSESSMENT

**Partner:** Interstate Technology and Regulatory Council (ITRC)

**Challenge:** Need for specialized risk assessment training (completed)

**Resource:** Training module, *Decision Making at Contaminated Sites: Issues and Options in Human Health Risk Assessment*



*"The experience and knowledge of EPA scientists were essential to the success of this important training used by state risk assessors and others to address complex challenges at contaminated sites."*

— California Department of Toxic Substances Control (State Co-Chair) Claudio Sorrentino

*"The ITRC risk training is more robust as a result of our partnership with EPA experts on this effort."* — South Dakota Department of Environment and Natural Resources (State Co-Chair) John McVey

EPA ORD partnered with ITRC, a program of the Environmental Research Institute of the States, to develop specialized training for state risk assessors responsible for the cleanup of chemicals released into the environment. Based on feedback from EPA's Risk Assessment and Training Experience (RATE) program, ORD scientists reached out to ITRC and proposed that ITRC create training modules on the harmonization of risk assessment approaches across state regulators. EPA experts provided materials developed for its RATE program for the ITRC effort. These materials provide up-to-date and comprehensive training for human health risk assessment, ranging from beginner to expert classes.

The ITRC team of approximately 75 representatives from various environmental sectors completed a comprehensive web-based training module entitled, *Decision Making at Contaminated Sites: Issues and Options in Human Health Risk Assessment*. ORD scientists provided expert technical support as needed along the development processes and extensive peer reviews before release of the final product. Currently, all interested risk assessors in the U.S. and around the globe have free access to this important training material (<http://www.itrcweb.org/risk-3/>). To date, more than 2,700 people have taken the online course and the associated guidance document is available to download.

**Partner:** Public health agencies of Arizona, Colorado, New Mexico and Utah; New Mexico Environment Department; New Mexico Environmental Public Health Tracking Program; New Mexico Department of Health Private Well Program

**Challenge:** Persistent environmental health disparities that are common to the four states such as heavy metal mixtures and well water concerns

**Resource:** Center for Native American Environmental Health Equity Research



*“The Center’s research results informed the work on exposure assessments to metals from private drinking water conducted among communities in the Four Corners’ states regions; we look forward to continuing this beneficial exchange of technical expertise.” — New Mexico State Epidemiologist Dr. Mike Landen*

Many Native American communities are impacted by mine wastes and heavy metal contamination from abandoned mines. There is also community concern about how these contaminants impact human health and cultural practices. To help address these challenges, the EPA and NIH have jointly funded the [Center for Native American Environmental Health Equity Research](#).

The Center investigated various metal of concern (uranium, arsenic, manganese, mercury) and community- relevant metal mixtures in blood and urine samples obtained from community members. They also conducted mechanistic experimental studies to explore immunologic effects. The results of this research were presented at the *Four Corners States Biomonitoring Consortium (4CSBC)*, organized by the state public health agencies of Arizona, Colorado, New Mexico and Utah. At the 2016 Annual 4CSBC Face-to-Face Meeting (September 28-30, 2016, Santa Fe, NM), the Center’s Director presented and contributed to the discussion of biosample collection protocols (blood, urine). She applied the lessons learned in her center’s previous Navajo Birth Cohort Study (funded by National Institute of Environmental Health Sciences) and subsequent analysis of biomonitoring for metals exposure conducted as part of the current center.

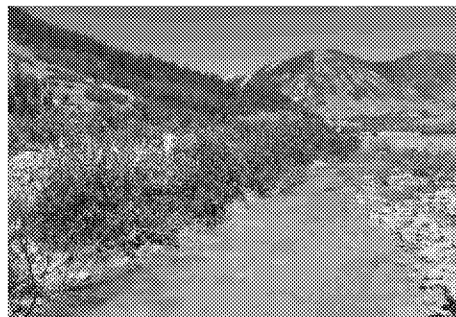
The Consortium developed three studies to investigate exposure and shared regional geophysical, cultural, economic, industrial, agricultural and political environment. For example, the consortium utilized the Center’s findings as a starting point for a new study, entitled, “The private well drinking water and metals contamination study.” A study undertaken by the New Mexico Biomonitoring Program included environmental sampling and assessment of water quality from domestic wells. They conducted laboratory analysis of well-water samples for arsenic, cadmium, manganese, mercury, selenium, and uranium. Testing of water from domestic wells helped to identify potential sources of excessive exposures to those metals. Through this project, participants and communities learned about their water quality, and possible actions to control exposures. Ongoing efforts include investigating potential exposures to metals in drinking water across the state, investigating potential exposure to phthalates and other chemicals from the use of plastics and some consumer products, and chemicals used in some pesticides. At the local level, this collaborative project identified potential communities to include for monitoring, strengthened participant recruitment, and built collaborations with local governmental agencies and community coalitions in the recruitment and samples collection processes. The major impact of these efforts included developing states’ capacity to conduct environmental exposure assessments through biomonitoring studies and investigating regional exposure concerns.

## REMEDIATION – CONTAMINATED SITES AND SUPERFUND

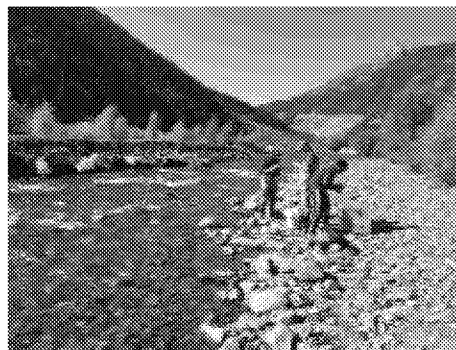
**Partner:** New Mexico Environment Department (NMED), New Mexico Tech, University of Iowa, and Ohio State University

**Challenge:** Environmental sampling and assessment of local waterways and sediments following Gold King Mine Spill (completed, but assistance ongoing)

**Resource:** Center for Native American Environmental Health Equity Research



*"ORD's support of the Center for Native American Environmental Health Equity Research has helped NMED reach out to and coordinate with Navajo Nation communities that were affected by the Gold King Mine spill," – Dennis McQuillan, Chief Scientist, NMED*



In 2015, about 3 million gallons of contaminated waste water from the Gold King Mine spilled into the Animas River impacting several tribes and states. Following the spill, a team of researchers from the [University of New Mexico Center for Native Environmental Health Equity Research](#) and New Mexico Tech, in collaboration with the New Mexico Environment Department (NMED), performed a sampling trip collecting water and sediment samples from Silverton, CO to Farmington, NM. The results obtained from this work were presented at the [Environmental Conditions of the Animas and San Juan Watersheds](#) conference (Farmington, NM; May 17-18, 2016) which was co-organized by their collaborator from NMED and other staff from the New Mexico Water Resources Institute and institutions from the state of New Mexico.

As a result of this work, the Center, in collaboration with NMED, the University of Iowa, and The Ohio State University, initiated an investigation of the mineral phases and metal release by microbiological activity from sediments collected along the Animas River after the spill which impacted the Navajo Nation. Additionally, NMED has utilized the information generated by the Center to propose a long-term monitoring program that has been partially funded by EPA.

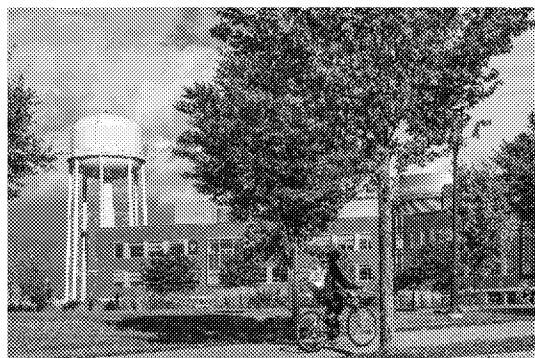
The EPA ORD-supported [Center for Native American Environmental Health Equity Research](#), jointly funded by EPA and NIH, was established to address pervasive environmental health disparities. The Center's primary focus is biomedical and environmental research and Native-focused community engagement. The research team aims to expand their understanding of mixed-metal toxicity and enhance confidence in the characteristics of the metal exposures and the populations that influence the generalizability of the results.

## WATER

**Partners:** Ohio Environmental Protection Agency (EPA), Association of State Drinking Water Administrators (ASDWA) and other state contributors

**Challenge:** Providing information, technical assistance, and training to small drinking water systems (ongoing)

**Resource:** Webinars, workshops and workgroup to address challenges and treatment solutions for small systems



*"It's very important that we provide small water systems with timely, easy to use, and accessible tools and training to assist in operating these critical public water systems, and the webinars and one-on-one meetings are perfectly suited to meet this need."* — Ohio EPA Craig Butler (former director)

EPA's ORD and Office of Water, in coordination with Ohio EPA and ASDWA, began hosting a monthly webinar series in 2015 targeted to state agencies on challenges and treatment solutions for small water systems. Because they tend to have fewer resources than larger systems, small systems can face enormous challenges in consistently providing safe and reliable drinking water. As of September 2019, the series has attracted over 50,000 participants from all 50 states, including 38 tribal nations, and several U.S. territories, and has provided over 32,000 continuing education credits. Presenters are typically from EPA and the states to help encourage communication between EPA and the states and between the states themselves.

Schedule, registration, and recordings: [epa.gov/water-research/small-systems-monthly-webinar-series](http://epa.gov/water-research/small-systems-monthly-webinar-series).

In addition to the webinar series, EPA's ORD and OW, in partnership with ASDWA, hosts a free annual workshop to provide in-depth information and training on various solutions and strategies for handling small drinking water system challenges. It is primarily designed for state personnel responsible for drinking water regulations compliance and treatment technologies permitting. The 2019 workshop attracted 422 attendees, including representatives from 53 state/territory agencies from 40 states and 3 territories, 40 water utilities, 9 federal agencies, and 3 tribal nations. In collaboration with Ohio EPA, the workshop provided over 1,700 continuing education contact hours ([gov/water-research/16th-annual-epa-drinking-water-workshop-small-systems-challenges-and-solutions](http://gov/water-research/16th-annual-epa-drinking-water-workshop-small-systems-challenges-and-solutions)).

Both the webinar series and the workshop allow EPA to communicate directly with the states to provide training and foster collaboration and dissemination of information. This, in turn, provides them with information and resources needed to communicate the latest scientific advancements and current guidance to their small systems. These forums also provide EPA invaluable information on the problems that states are currently encountering in their day-to-day interactions with their small systems. With this increased awareness, ORD experts can then modify their research to solve real-world problems that small systems are experiencing.

Formed during the 2011 workshop, ORD also leads an EPA/states small drinking water systems technical communications workgroup focused on targeted outreach efforts. In addition to EPA staff, the workgroup includes state regulatory agency and small water utility representatives from 13 states. The workgroup meets on a regular basis to decide on needed topics for the webinar series and to discuss the development of new tools.

**Partner:** Texas Commission on Environmental Quality (TCEQ), Texas Department of State Health Services (DSHS) and City of Corpus Christi

**Challenge:** Chemical contamination in Corpus Christi's water supply (completed)

**Resources:** Determine health risks and action level



*"The water situation in Corpus Christi in December 2016 was a good example of cooperation between Texas and EPA and the success we have when all work towards solving an environmental issue." – TCEQ Bryan W. Shaw (former Chairman)*

In December 2016, EPA ORD scientists, in coordination with Region 6 (South Central U.S.), responded to a request for assistance in Texas after an asphalt emulsifying agent, Indulin AA-86, contaminated Corpus Christi's water supply. Toxicity information along with treatment options to remove this chemical from water was lacking. ORD researchers provided

assistance early in the response concerning decontamination approaches that might be suitable for use in removing the contaminant from the system. In addition, EPA helped dissect and understand the toxicity of the chemical and possible risks associated with ingestion of contaminated water and the water-soluble salt from the product. Texas state agencies, TCEQ and the Texas DSHS, along with ORD researchers and their colleagues across EPA worked together to establish a health-based action level for the contaminant and supported an immediate need to protect public health.

# science in ACTION

**Partners:** AR, AZ, CA, CO, FL, ID, IO, KS, KY, LA, MO, ND, NY, OH, OR, PA, RI, SC, SD, TN, UT, VT, WA, WI and WY state environmental or health departments

**Challenge:** Support the environmental management and public use of U.S. lakes and reservoirs by providing a capability of detecting and quantifying cyanobacteria harmful algal blooms using satellite data records (ongoing)

**Resource:** Provide satellite derived measures of cyanobacteria, software and training in collaboration with the National Aeronautics and Space Administration (NASA), National Oceanic and Atmospheric Administration (NOAA), and U.S. Geological Survey (USGS)



*"The images we've been receiving through the CyAN project have been tremendously helpful to the Utah Division of Water Quality (UDWQ), providing the foundation for a wide range of useful outputs. It allows UDWQ to better target field sampling and more efficiently use our limited resources to protect public health. Finally, images are easily shared with response agencies as a useful visual communication aid." — UDWQ Biological Assessment and Harmful Algal Bloom Programs Coordinator Benjamin M. Holcomb*

Cyanobacteria blooms are an environmental and human health problem across the U.S. They are capable of producing toxins, odors, and surface scum that threaten the health of humans and animals, the quality of drinking water supplies, and the ecosystems in which they develop. Scientists at EPA are part of a team of specialists using remote sensing data to improve cyanobacteria detection methods. Improving the detection process would help state environmental and health agencies better determine whether to post public advisories to protect aquatic and human health.

The Cyanobacteria Assessment Network (CyAN) Project is a multi-agency effort among EPA, NASA, NOAA, and USGS to develop an indicator system using historical and current satellite data to quantify the temporal frequency, spatial extent, and magnitude of blooms in U.S. lakes. CyAN is providing weekly cyanobacteria monitoring data to state environmental and health departments from the European Space Agency Sentinel-3 satellite, training opportunities, and software applications. [www.epa.gov/cyanoproject](http://www.epa.gov/cyanoproject)

As part of the CyAN Project, EPA developed the CyAN app, an easy-to-use and customizable mobile application that provides access to algal bloom satellite data for over 2,000 of the largest lakes and reservoirs across the United States. EPA scientists developed the CyAN app to help local and state water quality managers make faster and better-informed management decisions related to cyanobacterial blooms. The app is free and available for download on Android devices™. During the CyAN app development, several states participated in beta testing, including Arizona, Arkansas, California, Colorado, Florida, Idaho, Iowa, Kansas, Kentucky, Louisiana, Missouri, New York, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Utah, Vermont, Washington, Wisconsin, and Wyoming. [www.epa.gov/water-research/CyANapp](http://www.epa.gov/water-research/CyANapp)





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